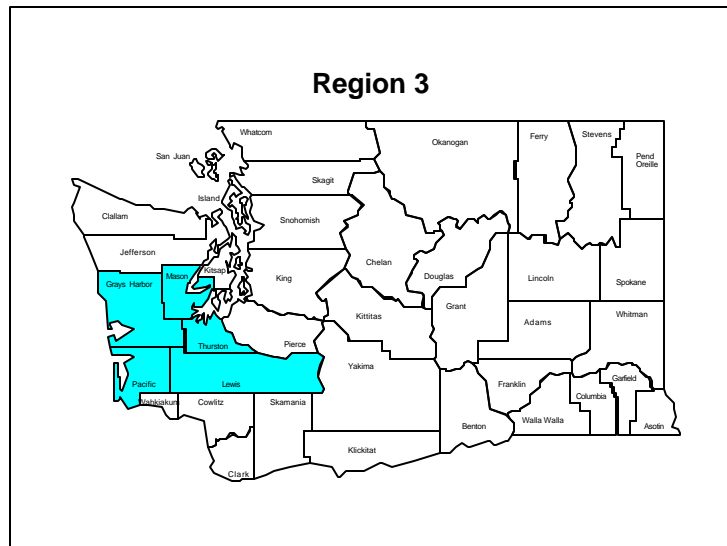


## Region 3

Region 3 includes the counties of Grays Harbor, Lewis, Mason, Pacific, and Thurston in the west-central portion of the state.

The region's terrain runs from seashore along the Pacific Coast in the west to the shores of Puget Sound and Hood Canal on the northeast to mountains in the crest of the Cascade Range in the southeast.

The region also is a mix of urban and rural, with a significant portion of its population in the Olympia-Lacey-Tumwater area of urban Thurston County. Olympia is the state capital. The other, less-urbanized counties have large retirement-age populations, with one in five Pacific County residents age 65 or older. The region grew at about the same rate as the state in the 1990s; people moving in heavily influenced growth in Mason and Thurston Counties. About 7 percent of the state's population lives in Region 3.



Like most regions of the state, Region 3 is becoming more diverse, although its population remains predominantly white. Grays Harbor and Mason Counties have significant Native American populations.

The region's economy, once dependent upon its natural resources, particularly timber, has evolved in recent years. While forest products industries still play a major role in the economies of most counties, industries of the trade and services sectors have become more important; in coastal communities, industries related to tourism have grown in recent years. The influence of state government is important, providing more than two of every five jobs in Thurston County. However, the other four counties were considered distressed in 2003 because their unemployment rate was at least 20 percent greater than the state average during the 2000-2002 period. A significant percentage of the region's workforce commutes to jobs outside of their counties of residence.

### The Counties

#### *Grays Harbor County<sup>1</sup>*

Grays Harbor, with an area of 1,917 square miles, is 15th largest among the 39 Washington counties.

The county's population was 67,194 in 2000, making it the 17th largest in the state. Its population grew only about 5 percent during the 1990s, far less than the state.

### Region 3

Cities in Grays Harbor County experienced very different growth rates between the 1990 and 2000 census. Aberdeen, the county's largest city, lost population, along with McCleary. Hoquiam and Elma experienced negligible growth. Ocean Shores, on the other hand, grew by more than 70 percent, and Oakville grew by 29 percent. About two-thirds of the county's population lives in its incorporated cities.

The county has two Indian Reservations. The Quinault Reservation is in the northwest corner of the county along the Pacific Coast. A portion of the Chehalis Reservation is in the southeast corner of the county. Native Americans make up nearly 5 percent of the county's population.

The terrain of Grays Harbor County varies only slightly. Two large bays – Grays Harbor and Willapa Harbor – dominate the coastal characteristics of the region. As one moves inland, the terrain shifts from the river lowlands and rolling hills in the south to the Olympic Mountains in the north. More than 90 percent of the county is forest.

Grays Harbor County sits along the Pacific coast at the southern part of the Olympic Peninsula. Bordering the county are Jefferson County to the north, Mason and Thurston Counties to the east, and Lewis and Pacific Counties to the south.

Economic conditions in Grays Harbor County were difficult in the 1980s and 1990s. The county, long reliant upon its natural resource base, saw that base dwindle due to industry restructuring, modernization, and environmental concerns. While the timber industry no longer dominates the local economy, it still plays a major role. Significant growth in the trade and services sectors has more than offset declines in manufacturing employment, but the trade-off has resulted in lower wages.

The county has worked to diversify its economy in recent years; the trade and services sectors, with numerous tourism-related activities, are providing a growing number of jobs. However, Grays Harbor County was considered a distressed county in 2003.

#### *Lewis County<sup>2</sup>*

Lewis County has an area of 2,408 square miles, sixth largest of Washington's counties, but largest in the western half of the state.

Its population in 2000 was 68,600, up more than 15 percent from 1990; it grew about two-thirds the state average during the decade. Eighty-one percent of the population growth in Lewis County during the 1990s was due to people moving into the county; it appears the county is attractive to retirees looking for a nice piece of land and people fleeing the urbanization of Thurston County.

It is a relatively rural county, with about 60 percent of its population living in unincorporated areas. It is less densely populated than its neighbors to the north and to the south; its density of 29 people per square mile contrasts to Thurston County's 278 people per square mile and Cowlitz County's 82 people per square mile.

### Region 3

Centralia is the largest city in the county, with half of the incorporated population; Chehalis, Morton, Napavine, and Winlock follow it in size.

Lewis County's elevation varies widely. The broad, relatively flat and low-lying western section of the county gives way to the rugged Cascade Mountains in the east. In the Centralia-Chehalis area, the elevation is about 185 feet above sea level; to the east, around White Pass, a popular skiing area, it goes above 5,000 feet. Old Snowy Mountain, near the Cascade Crest, is 7,950 feet, the highest point in Lewis County.

About three-fourths of the county is rugged, mountainous, and forested. The remainder has low, rolling hills interspersed with rivers and tributaries. Significant rivers include the Cowlitz, Chehalis, Skookumchuck, and Newaukum. Chehalis and Centralia are in the floodplains of the Chehalis River and its tributaries. The Cowlitz is particularly important because of its fish runs and hydroelectric production. Mayfield and Riffe Lakes are the largest bodies of water in Lewis County.

Eight other counties border Lewis County: to the north are Grays Harbor, Thurston, and Pierce Counties; to the east is Yakima County; to the south are Skamania, Cowlitz, and Wahkiakum Counties; and to the west is Pacific County.

Lewis County's economy is in transition. While much of the county is involved with agriculture and forestry, the timber industry has declined. On the other hand, light industry and retail trade have been increasing; Chehalis, Centralia, and most recently Packwood have developed industrial parks. The county is moving from a resource-based, extractive economy to one with an emphasis on light manufacturing, wholesale distribution, and commerce. Lewis County was considered a distressed county in 2003.

#### *Mason County<sup>3</sup>*

Mason County has an area of 961 square miles, ranking 29th in size.

The county's population in 2000 was 49,405, growing nearly 29 percent from 1990. It grew faster than the state as a whole. People moving into the county – primarily commuters who worked elsewhere – drove population growth during the decade.

Mason County ranked 15th out of the 39 Washington counties in population density. The county averaged about 52 persons per square mile, compared to 90 persons for the state. Four out of every five people live in unincorporated areas. Shelton is the county's only city. The balance of the population lives near the county's 12 communities along Hood Canal or South Puget Sound inlets.

The county also is home to the Skokomish and Squaxin Island Indian tribes. Most of the Skokomish live on or near the tribe's reservation at the mouth of the Skokomish River on the southern end of Hood Canal. The Squaxin Island Reservation is near Kamilche in the southeast section of the county.

### Region 3

Like neighboring Thurston County, prehistoric glacial activity heavily influenced Mason County's terrain. Mountainous areas in the county's interior evolved into dense forest. Much of the north county area is in the Olympic National Forest or Olympic National Park; elevations reach 6,000 feet above sea level. The lower, non-forested areas are fertile loam. The county has nearly 100 lakes; the larger lakes are Lake Cushman, Mason Lake, Lake Limerick, Isabella Lake, Timberlakes, and Spencer Lake.

The longest river is the Skokomish River. Formed high in the Olympic Mountains, the Skokomish flows southeasterly through the county before emptying into Hood Canal. One fork of the Skokomish feeds Lake Cushman and the hydroelectric power plant at Potlatch. Other notable rivers in Mason County are the Satsop and Hamma Hamma Rivers.

Mason County's boundaries are a mix of land and water. Jefferson County borders Mason County to the north, Grays Harbor County to the west and southwest, and Thurston County to the southeast. The county's eastern boundary—shared with Kitsap, Pierce, and Thurston counties—is Hood Canal and Puget Sound's Case Inlet.

Of the county's traditional industries—logging and lumber, farming and dairying, and oyster cultivation—only logging and lumber remains prominent. However, this industry has been under pressure from increasing environmental regulations and external competition; lower-paying service-oriented jobs increasingly have replaced jobs in forest products industries. This blue-collar county looks more like a bedroom community to Thurston County to the west. Construction of homes has boomed, and casinos offer a more diverse entertainment setting to compliment the natural beauty of Hood Canal and the Olympic Mountains. Despite the economic changes occurring, Mason County was considered a distressed county in 2003.

#### *Pacific County<sup>4</sup>*

Pacific County has an area of 908 square miles, making it the 30<sup>th</sup> largest of 39 counties in the state.

The county's population in 2000 was 20,984, an 11 percent increase from 1990; it grew at half the rate of the state. Its population makes Pacific County the 28th largest in the state. It is a rural county, with a population density of just 21.5 persons per square mile; two-thirds of its population lives in unincorporated areas. Pacific County has four cities: Ilwaco, Long Beach, South Bend, and Raymond, the largest.

Median age—the age where half the population is younger and half is older—is 45.8 years, more than 10 years older than the state. Pacific County has larger populations, percentage wise, in the 45-64 and 65-plus age groups, than the state as a whole.

Pacific County sits along the Pacific coast. Its coastline extends from the mouth of the Columbia River to just south of Grays Harbor. Bordering the county are Grays Harbor County to the north, Lewis County to the east, and Wahkiakum County and the Columbia River and the State of Oregon to the south.

### Region 3

The topography of the region varies slightly. Willapa Harbor dominates the coast. Moving inland, the terrain shifts from the river lowlands to rolling hills. More than 90 percent of the county is forest.

As in Grays Harbor County, economic conditions in Pacific County were difficult in the 1980s and 1990s. Industry restructuring, modernization, and environmental concerns caused the county's manufacturing base, primarily in forest products industries, to shrink; it no longer dominates the local economy. While the trade and services sectors grew significantly, the trade-off resulted in lower wages. Tourism-related activities provide a growing number of jobs. Like its neighbor to the north, Pacific County was considered a distressed county in 2003.

#### *Thurston County<sup>5</sup>*

Thurston County has an area of 727 square miles, ranking it 32nd in size among the state's counties.

Its population in 2000 was 207,355, nearly 29 percent greater than in 1990. The population has nearly tripled in size since 1970. It grew faster than the state during the 1990s; people moving in drove Thurston County's growth, accounting for three of every four new people.

Olympia is the county's largest city; it also is the county seat and the state capital. Just less than one-half of Thurston County's residents lived in incorporated areas, most in the Olympia-Lacey-Tumwater area. Other cities in the county are Yelm, Tenino, Rainier, and Bucoda. The county also is home to the Nisqually Indian Reservation southeast of Olympia.

Much of the area of the west and northwest portions of Thurston County is part of state-owned Capitol Forest. The land is hilly; its highest point is Capitol Peak, at 2,658 feet. The topography is similar at the southeast end of the county. The central and northeast reaches of the county are relatively flat, low prairies and river deltas. A number of rivers run through the county on their way to Puget Sound: the Nisqually, Deschutes, Black, and Skookumchuck Rivers. The county abounds with lakes and ponds; the largest bodies of water within the county are Black Lake, Offut Lake, Summit Lake, Lake Lawrence and Lake St. Clair.

Thurston County sits at the foot of Puget Sound; saltwater inlets form its northern boundary. Bordering the county to the south is Lewis County, to the west is Grays Harbor County, and to the north is Mason County. The Nisqually River forms its eastern boundary with Pierce County.

As with other counties in this region, Thurston County's economy began as one driven by its natural resources. Manufacturing, specifically forest products industries, dominated the county until the 1950s, when government became the leading economic force. Government, particularly state government, now contributes more than 40

### Region 3

percent of the county's jobs. Thurston County is a bedroom community for nearby military bases in Pierce County, and it is the retail core for much of this region.

#### Population and Demographics

As shown in Table 1 below, Region 3's population at about the same rate as the state as a whole during the 1990s. Mason and Thurston Counties grew much faster, and the other three grew more slowly. The region is expected to grow faster than the state through the year 2025, again with Mason and Thurston Counties leading the way.

**Table 1. Population Growth**

	<b>1990 Population</b>	<b>2000 Population</b>	<b>% Change</b>	<b>2025 (Projected)</b>	<b>% Change from 2000</b>
Grays Harbor	64,175	67,194	4.7%	77,269	15.0%
Lewis	59,385	68,600	15.5%	90,678	32.2%
Mason	38,341	49,405	28.9%	75,088	52.0%
Pacific	18,882	20,984	11.1%	22,678	8.1%
Thurston	161,238	207,355	28.6%	336,825	62.4%
<b>Total</b>	<b>342,021</b>	<b>413,538</b>	<b>20.9%</b>	<b>602,538</b>	<b>45.7%</b>
<i>Washington State</i>	<i>4,866,663</i>	<i>5,894,121</i>	<i>21.1%</i>	<i>7,975,471</i>	<i>35.3%</i>

Source: U.S. Census Bureau, Census 2000; *2002 Population Trends*, State of Washington Office of Financial Management, Forecasting Division; *Washington State County Population Projections For Growth Management*, Intermediate Projection, State of Washington Office of Financial Management, Forecasting Division, January 2002.

About three out of every five residents of the region live in densely populated areas, primarily around Lacey, Olympia and Tumwater in Thurston County, Aberdeen and Hoquiam in Grays Harbor County, and Centralia and Chehalis in Lewis County; see Table 2, below. The current growth pattern, both urban and rural, affects how agencies prepare for emergencies as changes in the population and development can increase risks associated with hazards.

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**Table 2. Urban/Rural Populations, 2000**

	<b>Urban</b>	<b>Rural</b>
Grays Harbor	40,679	26,515
Lewis	24,465	44,135
Mason	12,501	36,904
Pacific	10,261	10,723
Thurston	155,884	51,471
<b>Total</b>	<b>243,790</b>	<b>169,748</b>
Percentage	59.0%	41.0%
<i>Washington State</i>	<i>81.9%</i>	<i>18.1%</i>

Source: U.S. Census Bureau, Census 2000:  
Population and Housing by Urban Classification.

The ability to prepare for and recover from a disaster varies among population groups. Research on various population groups and disasters found that it took some populations longer to recover from a disaster for a variety of reasons. These population groups include minorities, people with language barriers, the disabled, senior citizens, and those with low income.

### *Ethnic Groups*

People from non-white population groups generally experience longer recoveries due to lower incomes, savings and insurance; their difficulty accessing insurance; and their using aid and relief organizations differently than was anticipated. Language and cultural differences can pose difficulties in some populations understanding and implementing preparedness and mitigation actions as well as accessing and using available disaster relief.

Table 3, below, shows that Region 3, overall, is less diverse than the state as a whole. Grays Harbor and Mason Counties have significant Native American populations, while about 5 percent of residents in all counties are of Hispanic origin. The growth rate of most ethnic groups outpaced that of the white population during the 1990s.

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**Table 3. Population by Ethnic Group**

	Hispanic/ Latino	Asian	African American	Native American	Total
Grays Harbor	4.8%	1.2%	0.3%	4.7%	11%
Lewis	5.4%	0.7%	0.4%	1.2%	7.7%
Mason	4.8%	1.1%	1.2%	3.7%	10.8%
Pacific	5.0%	2.1%	0.2%	2.4%	9.7%
Thurston	4.5%	4.4%	2.4%	1.5%	12.8%
<i>Washington State</i>	<i>7.5%</i>	<i>5.5%</i>	<i>3.2%</i>	<i>1.6%</i>	<i>17.8%</i>

Source: U.S. Census Bureau, Census 2000.

Even though Region 3 is not as diverse as the state, a sizable faction of its population does not speak English as its primary language at home and speaks English less than very well, as shown in Table 4, below. This means that a percentage of the population may have a language barrier that prevents them from preparing for a disaster, responding to an event, or applying for assistance after a disaster.

**Table 4. Primary Language Spoken at Home**

	Language Other Than English	English Less Than Very Well	Spanish	English Less Than Very Well	Other Indo- European	English Less Than Very Well	Asian- Pacific Islander	English Less Than Very Well
Grays Harbor	6.4%	3.1%	3.9%	2.2%	1.3%	0.3%	1.0%	0.6%
Lewis	6.4%	3.0%	4.5%	2.4%	1.3%	0.4%	0.4%	0.2%
Mason	6.3%	2.7%	3.4%	1.8%	1.5%	0.2%	1.0%	0.5%
Pacific	8.2%	3.7%	4.2%	2.2%	1.8%	0.2%	2.0%	1.2%
Thurston	9.2%	3.5%	2.8%	1.0%	2.3%	0.5%	4.0%	2.0%
<i>WA State</i>	<i>14.0%</i>	<i>6.4%</i>	<i>5.8%</i>	<i>2.8%</i>	<i>3.2%</i>	<i>1.3%</i>	<i>4.4%</i>	<i>2.2%</i>

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000

### *Disabled People*

Community preparedness activities often do not consider the needs of people with disabilities. They have complex challenges because of hearing, sight, mobility, or mental impairments. Additionally, a significant percentage of working-age people with disabilities do not work. These factors make it difficult for the disabled to prepare in advance of a disaster.



### Region 3

Table 5, below, shows there is a slightly greater percentage of people of working age with a disability that does not require them to be institutionalized. About half have jobs; only the percentage of Thurston County's population of working disabled approaches the state average; the rest have a lower percentage. Between 40 and 50 percent of retirement-age people in the region have a disability.

**Table 5. Non-Institutionalized Disabled Population**

	21 to 64 Years		65 Years and Older
	% of Population	% Employed	% of Population
Grays Harbor	24.0%	44.4%	48.6%
Lewis	24.2%	46.8%	47.8%
Mason	23.1%	51.0%	38.1%
Pacific	26.3%	41.9%	47.7%
Thurston	18.9%	57.9%	41.6%
<i>Washington State</i>	<i>17.7%</i>	<i>57.6%</i>	<i>42.3%</i>

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000.

#### *Senior Citizens*

Preparedness and recovery activities may overlook senior citizens; their age could lead them to have difficulty after a disaster, perhaps not qualify for loans, or become disabled because of the disaster. Table 6, below, shows all counties except Thurston have a larger percentage of their population over the age of 65 than the state as a whole; in Pacific, more than one of every five people are retirement age. Grays Harbor, Lewis, and Mason Counties have growing retirement-age populations.

**Table 6. Population Over Age 65**

	% of Total Population
Grays Harbor	15.4%
Lewis	15.5%
Mason	16.5%
Pacific	22.6%
Thurston	11.4%
<i>Washington State</i>	<i>11.2%</i>

Source: U.S. Census Bureau, Census 2000

## Region 3

### *Poverty*

The amount of money people have influences what type of housing they live in, whether they can engage in mitigation actions, and how long it takes to recover. Income is based on a number of factors, including the individual, the economy, availability of jobs, educational opportunity, among others. Expenses can vary by location – rural places are cheaper to live but have fewer jobs, while urban areas can be costly, even for renters.

Table 7, below, shows that all counties but Thurston have a larger percentage of people living in poverty than the state as a whole. In the past 30 years, Grays Harbor, Lewis, Mason and Pacific Counties have lost a significant number of high-paying manufacturing jobs, particularly in forest products industries in recent years. Most of those jobs were replaced with lower-paying trade and service sector jobs. These four counties have been classified as distressed because their rate of unemployment has been at least 20 percent higher than the state average for three consecutive years (most recently, the 2000-2002 period). Thurston County, on the other hand, has a smaller percentage of people living in poverty, primarily because of the significant influence of well-paying government jobs.

**Table 7. Poverty Rates**

	<b>% of Total Population</b>	<b>Children Under 18</b>	<b>Over Age 65</b>
Grays Harbor	16.1%	21.6%	9.4%
Lewis	14.0%	18.6%	9.4%
Mason	12.2%	17.3%	4.9%
Pacific	14.4%	19.7%	8.1%
Thurston	8.8%	9.8%	5.0%
<i>Washington State</i>	<i>10.6%</i>	<i>13.2%</i>	<i>7.5%</i>

Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000.

### *School Children*

While children overall are captured in figures elsewhere in this profile, the number of children attending school is a concern because many of the school buildings they spend considerable time in each day are older and potentially more vulnerable to the effects of disaster. Table 8, below, shows the population of school-age children in Region 3; it does not show the number that are in potentially vulnerable buildings.

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**Table 8. School Enrollment – Kindergarten through High School**

	<b>Total</b>	<b>Kindergarten</b>	<b>Elementary</b>	<b>High School</b>
Grays Harbor	13,284	892	8,045	4,347
Lewis	13,805	845	8,446	4,514
Mason	9,123	669	5,554	2,900
Pacific	3,735	251	2,179	1,305
Thurston	40,428	2,807	24,149	13,472
<b>Total</b>	<b>80,375</b>	<b>5,464</b>	<b>48,373</b>	<b>26,538</b>
<i>Washington State</i>	<i>1,127,448</i>	<i>82,637</i>	<i>697,192</i>	<i>347,619</i>

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000.

## Housing

Washington's Growth Management Act encourages local jurisdictions to direct population growth into urban growth areas, where urban services can support growth and higher densities. It also requires communities to incorporate mitigation by protecting critical areas and restricting development in areas such as those that are frequently flooded or subject to geologic hazards. Eliminating or limiting development in hazard-prone areas can reduce vulnerability to hazards and the potential loss of life and injuries and property damage.

Table 9, below, provides a breakdown by county of various housing characteristics.

**Table 9. Housing Development**

	<b>Single-Family</b>	<b>Multi-Family</b>	<b>Mobile Homes</b>	<b>Other</b>
Grays Harbor	70.2%	14.6%	14.0%	1.2%
Lewis	68.3%	11.2%	19.5%	1.0%
Mason	71.0%	4.5%	21.3%	3.2%
Pacific	68.0%	7.5%	21.2%	3.3%
Thurston	66.8%	29.6%	13.1%	0.5%
<i>Washington State</i>	<i>65.4%</i>	<i>25.6%</i>	<i>8.5%</i>	<i>0.5%</i>

Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000.

The year housing was built is important for mitigation. The older a home is, the greater the risk natural disasters pose to it. Homes constructed after 1980 are more likely to withstand damage from hazards such as floods, high winds, snow loads, and earthquake because they were built with modern building codes. Table 10, below, shows the general age of the region's housing.

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Counties that have grown faster in recent years – Mason and Thurston – have newer housing stock, with close to half their housing units built since 1980. Grays Harbor, Lewis, and Pacific Counties have more housing stock that is older; their growth took place in earlier years.

**Table 10. Housing – Year Built**

	<b>Pre-1939 – 1959</b>	<b>1960 – 1979</b>	<b>1980 – 2000</b>
Grays Harbor	41.8%	33.5%	24.7%
Lewis	36.9%	31.1%	32.0%
Mason	16.6%	36.1%	46.3%
Pacific	36.2%	29.6%	34.2%
Thurston	16.9%	35.5%	47.6%
<i>Washington State</i>	<i>29.4%</i>	<i>32.7%</i>	<i>37.9%</i>

Source: U.S. Census Bureau, Profile of Housing Characteristics 2000

### Household Income

Median household income is an indicator of a region's economic stability. It compares economic areas as a whole, and it generally shows distribution of income among the population. Median household income indicates that point where half of all households have a higher income, and half have a lower income.

Table 11, right, shows that median household income in all counties except Thurston is lower than the state average. Grays Harbor, Lewis, Mason and Pacific Counties have seen their economies significantly restructured in recent years as the preponderance of their jobs have moved from manufacturing industries to jobs in much lower paying trade and service industries. They also have retirement-age populations larger than the state average. Thurston County's median household income is higher than the state average – it ranks fifth in the state – due to the significant presence of government.

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**Table 11. Median Household Income**

County	Year 1999
Grays Harbor	\$34,160
Lewis	\$35,511
Mason	\$39,586
Pacific	\$31,209
Thurston	\$46,975
<i>Washington State</i>	<i>\$44,776</i>

Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000

### Employment and Industry

The economy of Region 3 is mixed. The forest products industry, dominant in Grays Harbor, Lewis, Mason, and Pacific Counties until the mid 1980s, has given way to trade and service related industries that serve growing a tourist trade and an aging population. Government employment has dominated Thurston County's economy in recent years.

Below are brief descriptions of the economy and employment in the region's five counties.

#### *Grays Harbor County*

The timber industry no longer dominates the economy of Grays Harbor County, but it still plays a significant role. Weyerhaeuser remains the largest employer, and Sierra Pacific Industries, a California- based forest products firm, built a new sawmill. The trade and services sectors have become major job providers, with tourism-related activities providing a growing number of jobs. Growth in these sectors has more than offset the declines in manufacturing; while this growth kept the labor force stable, the trade-off resulted in lower wages.

Trade is the largest sector of the Grays Harbor County economy, with nearly 24 percent of jobs, about the same as the state. About one in four jobs in this sector is in wholesale and retail trade; this is double the 1970 average. Eating and drinking establishments are top industry, followed by grocery stores.

The services sector is the second fastest growing in the county, accounting for 23 percent of employment. This sector grew substantially between 1970 and 1981, less so since then because of recession of 1990-91. Health services is largest industry in this sector and the highest paying. The next largest industries are lodging and membership organizations (the Quinault Indian Tribal administration).

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Government employment is an important aspect of the county's economy, with 22 percent of non-farm jobs. More than three fourths of all government employees work at the local level, nearly half in K-12 education. The majority of state employment is at two correctional facilities and the local community college.

Since 1970, manufacturing employment has fallen by 39 percent in Grays Harbor County. Lumber and wood processing dominates manufacturing, with logging the largest employer. Pulp and paper mills are major employers, but their continued prosperity depends upon a healthy supply of timber. Other industries in the manufacturing sector include food processing (canned fruits, canned and/or cured seafood) and shipbuilding and repair.

Construction is another sector that has experienced a contraction since 1970. Cessation of work on the nuclear power plants at Satsop and national recessions badly hurt this sector in the 1980s. Today, construction jobs account for more than 5 percent of employment in the county, the highest level since 1978.

Agriculture, forestry and fishing account for just 2 percent of employment in the county. The larger industries are berry farming (especially cranberries), dairy farming, veterinary services, forestry services, and commercial fishing. The bulk of commercial fishing is crabbing, oyster harvesting, and fin fishing.

#### *Lewis County*

Lewis County's economy appears diverse at first look. Upon closer examination, it is evident several sectors are unusually dominated by one industry – construction and mining by coal mining (30 percent), agriculture by forestry (42 percent), manufacturing by lumber and wood products (60 percent), and transportation and public utility by trucking and warehousing (50 percent). The timber industry heavily influences the latter three sectors listed above.

The trade sector increased its share of the county's jobs from 20 to 30 percent from 1970 to 1999, accounting for 42 percent of all new jobs created since 1970. Employment in trade has taken up much of the slack created by the decline or stagnation in other industries. A bright spot for the county has been the manufacturers' outlet shopping center in Centralia.

The services sector also increased its share of jobs in the county, to 19 percent in 1999. It provided the second-most new jobs for the county's economy from 1970 to 1999. The largest share of service sector employment was in health services, an unusually large 42 percent, compared to 26 percent for the state as a whole. With Providence Centralia Hospital, Lewis County is one of the few rural counties with such a significant health care presence.

Construction and mining provides about 7 percent of employment in Lewis County. It pays well, accounting for 11 percent of all wages in the county. Unlike most counties,

### Region 3

mining in Lewis County accounts for a significant portion of construction and mining sector jobs, 30 percent. Within construction, Lewis County has a higher proportion of heavy construction workers than the state, 26 percent compared to 13 percent.

Government accounts for 19 percent of county jobs, about two points greater than the state average. Public K-12 schools account for 71 percent of local government jobs. The U.S. Postal Service is the largest federal employer. At the state government level, the larger employers are Centralia College and state correctional facilities.

Despite very low growth, manufacturing still holds a significant share of employment compared to the state, 16 percent versus 13.8 percent. Sixty percent of manufacturing jobs are in the lumber and wood products industry. Food processing (frozen fruits and vegetables) and transportation equipment industries also provide significant employment.

Agriculture has about 4 percent of jobs in the county, with the bulk of employment in forestry. The transportation and public utilities sector also has about 4 percent of jobs, with most employment in trucking and warehousing, and in electric, gas, and sanitary utilities, which provide the highest average salary in the county.

#### *Mason County*

Of Mason County's traditional industries – logging and lumber, farming and dairying, and oyster cultivation – only logging and lumber maintains its prominence. However, the forest products industry has been under pressure from environmental regulations and external competition. Service-oriented jobs have increasingly replaced jobs in logging and timber.

While the tremendous growth of the services and trade sectors has provided an outlet for job seekers, it created many lower paying jobs. In Mason County, these sectors pay even less as they lack the industries that tend to boost wages – high tech and wholesale trade.

Government provides about three of every 10 jobs in Mason County, making it the largest sector of the county's economy. Government jobs have grown by 169 percent since 1970. Local government employs the greatest number of government workers in the county, with more than half of those in K-12 education. The Washington State Corrections Center and the Shelton School District are the second and third largest employers in the county. Mason General Hospital, a public hospital, provides significant employment.

Trade provides more than 21 percent of jobs, and is the largest economic sector after government. Since 1970, the number of trade workers has increased 223 percent. The largest industry in the trade sector is eating and drinking establishments, with roughly one-third of all trade employment in 2000.

### Region 3

The services sector has been the fastest growing economic sector since 1970; the number of jobs grew by 390 percent. It provides more than 19 percent of employment, only about two thirds as many as the sector at the state level. The downside of employment gains is that the average wage is relatively low and many industries in the sector have high levels of part-time work. Educational services, social services, and membership organizations (primarily from Native American tribal administration and tribal amusement and recreation services) are the largest components of this sector.

Manufacturing provides about 18 percent of county employment and pays among the highest wages in the county. Much of the recent loss of work in manufacturing, particularly forest products, is from increased competition from the southeastern U.S. and Canada. The slump resulted in is the loss of a large number of well-paying jobs. Forest products provide about 69 percent of manufacturing jobs in Mason County.

Construction and mining, with more than 5 percent of employment, and agriculture, forestry, fishing, with just 2 percent of jobs, are the smallest sectors of the county's economy.

#### *Pacific County*

The trade and services sectors have become major job providers in Pacific County, and their expansion is expected to continue, especially in tourism-related areas. While these sectors have experienced good growth in recent years, which has more than offset declines in manufacturing employment, the trade-off is lower wages on a job-for-job basis.

As with the other rural counties in this region, the economy of Pacific County is heavily dependent on the government sector. Government provides about three of every 10 jobs in the county, compared with 18 percent across the state. Local government makes up three quarters of the government presence, with K-12 education providing just less than one-half of all local government employment.

The services and trade sectors each provide about 22 percent of jobs in the county. They are the fastest growing sectors beside the relatively small finance, insurance, and real estate sector. In services, the lodging industry is largest employer, with one in four jobs, followed closely by health care. In trade, eating and drinking establishments and grocery stores provide the most jobs.

The number of jobs provided by manufacturing is just half of the level of 1970. Manufacturing provides about 16 percent of employment in the county; it consists almost entirely of logging, sawmills, and food processing (93 percent of manufacturing jobs).

Construction provides just 4 percent of jobs in Pacific County. And the agriculture, forestry, and fishing sector, dominant in the county's early days, has decreased to just about 1 percent of its economy. More than 70 percent of the sector's employment is in fishing, mostly for shellfish. Despite its small size, this sector provides 12 percent of



### Region 3

fishing, hunting and trapping jobs statewide. On the farming side are berries and tree fruits.

#### *Thurston County*

Government has provided from 40 to 50 percent of employment in Thurston County through the years. State government accounts for two-thirds of all government jobs. Being the seat of the state's government, the county is home of much of the infrastructure of state government, and is home to The Evergreen State College and South Puget Sound Community College. Local government employs close to 10,000 people, the bulk in K-12 education.

The services sector provides nearly one in four jobs. Employment in this sector more than doubled since 1970. Health services is the largest employing industry in the sector with one third of the jobs. Business services also provides significant employment.

Trade provides one job of every five in the county. Since 1970, employment growth increased by 266 percent, stronger than the statewide increase, though the sector is smaller than the state's 24 percent. The smaller share size is attributed to two factors – the tremendous size of the county's government sector and shoppers traveling north to Pierce and King Counties to make purchases from larger retail centers. Local merchants must compete with retail centers throughout western Washington for customers. Eating and drinking places is the largest industry in all of trade and the lowest paying.

Manufacturing accounts for just 5 percent of Thurston County's economy; this sector, particularly forest products, used to dominate employment in the county. Lumber and wood products remains the biggest industry in this sector. Food and kindred products is the sector's second largest industry; employment is concentrated in brewing (note: the Miller Brewery closed in spring 2003, after the Employment Security Department report was prepared), soft drinks, and dairy products.

Employment in construction and mining has fluctuated since the 1970s, and now stands at more than 4 percent of the economy. Non-residential construction such as office buildings and commercial establishments spurred the latest increase in employment in the late 1990s.

The agriculture, forestry, and fishing sector is relatively small in Thurston County, claiming just over 2 percent of jobs; the county's agricultural employment is about average in terms of western Washington. Blueberries, corn, and carrots are the primary field crops. Dairy cows and raising hens for broilers and eggs are significant industries; the county ranks seventh in the state for its inventory of dairy cows and fourth in the state for its broiler production. Tree fruits grown in the county include apple, cherry, plum, grape, and pear, scattered among about 100 farms.

Transportation, community and utilities, and the finance, insurance, and real estate sectors also are relatively small, providing more than 2 percent and about 4 percent of

### Region 3

jobs, respectively. Growth in transportation since 1993 has come from local trucking and air courier operations, and growth in the finance sector has been in banking.

#### Commuting Patterns<sup>6, 7</sup>

Recent population growth has resulted in a significant increase in workers, automobiles and trucks on the roads. A higher percentage of workers driving alone can cause traffic congestion and accidents. More traffic places a larger load on the region's transportation infrastructure. The impact of an emergency can disrupt automobile traffic, shut down transit systems, and make evacuations more difficult.

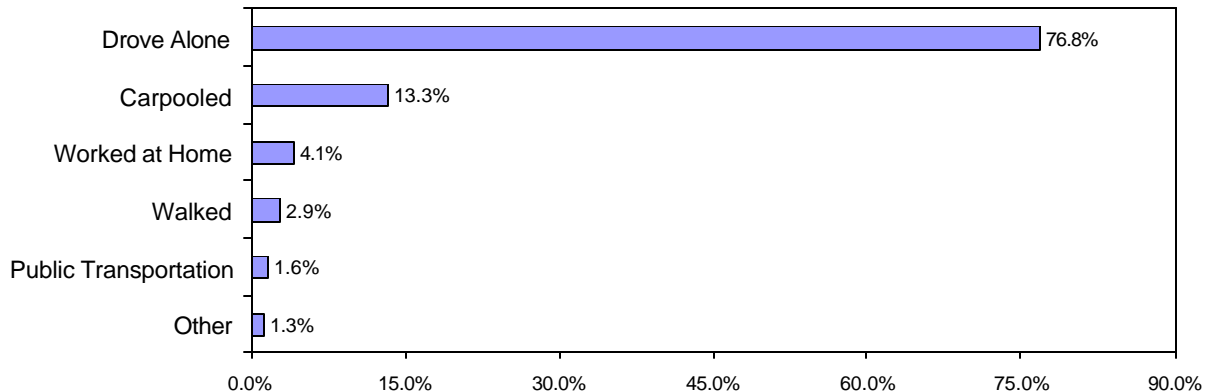
Region 3 is a region of commuters. Close to half of Mason County's workers commute to jobs elsewhere; about half of the commuters travel to Thurston County (more than 2,800) and Kitsap County (about 2,750), while most of the rest work in Pierce, King, and Grays Harbor Counties.

About one in four Thurston County workers commute to jobs outside the county; most travel to Pierce County (more than 14,300, many to Fort Lewis and McChord Air Force Base) and King County (more than 5,300), while smaller numbers commute to nearby Mason, Lewis, and Grays Harbor Counties.

About 10 percent of the workers in Grays Harbor, Lewis and Pacific Counties commute to jobs in neighboring counties.

Figure 1, below, shows transportation used by commuters. Primary mode of transportation is driving alone. Public transportation systems carried nearly 4 million passengers in 2001, nearly two-thirds by Thurston County's Intercity Transit, which operates both urban commuter and rural routes. Another quarter million passengers rode vanpools to and from Thurston County.

**Figure 1. Commuting Patterns**



Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000

## **Region 3**

### **Hazards and State Facilities Potentially At-Risk**

The regional hazard profiles were developed using information from the individual hazard profiles that are part of the Risk Assessment, as well as from reference documents listed at the end of each hazard profile.

Unless otherwise noted below, at-risk facilities were identified by state agencies participating in this plan using methodology identified in the Risk Assessment Introduction, Tab 7.

Figures for the number of staff/visitors/residents for each at risk facility were calculated on the highest use for that facility; for many structures, this inflates the number of individuals in the buildings at any one time.

The Washington Department of Transportation identified essential transportation corridors, or highways and ferry routes of greatest importance to transportation of people and goods and services.

## Region 3

### Hazard: Avalanche

Characteristics	Most Vulnerable Areas	Event History	Probability
<p>Avalanches occur when a layer of snow loses its grip on a slope and slides downhill. They occur frequently in the backcountry of the Cascade Range, often without any impact to people, transportation routes or development.</p> <p>Most avalanches that cause injuries or deaths occur outside developed recreation areas; the primary cause of these avalanches is the weight of the victim or someone in the victim's party on the slab of snow. Very few avalanche fatalities occur in on open runs in ski areas or on highways.</p> <p>Avalanche season begins in November and runs through early summer for all mountain areas of the state; in high alpine areas of the Cascade Range, the season is year-round.</p>	<ol style="list-style-type: none"><li>1. Cascade Mountains in eastern Lewis County</li><li>2. White Pass, U.S. Highway 12</li></ol>	<p>No reports available on avalanches that have taken place in Region 3.</p>	<p>On average, avalanches kill one to two people every year in Washington State.</p>

### Region 3

Hazard: Avalanche		At Risk Population: Unknown of 413,538		PRELIMINARY ASSESSMENT	
State Agency Structures At Risk Number and Function of Buildings		No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Structures	
<u>Total at-risk buildings</u> : One state highway, no buildings.		0	0	0	
<u>Function of at-risk buildings</u> : One state highway is potentially at risk to avalanche:					
1. U.S. Highway 12, as it moves into the Cascade Mountains in east Lewis County.					
<u>Total at-risk critical facilities</u> : One state highway, no buildings.		0	0	0	
<u>Function of at-risk critical facilities</u> : One state highway considered an emphasis corridor because of its importance to movement of people and freight is potentially at risk to avalanche:					
1. U.S. Highway 12, as it moves into the Cascade Mountains in east Lewis County.					

## Region 3

### Hazard: Drought

Characteristics	Principal Sources	Event History	Probability
<p>Drought is a prolonged period of dryness severe enough to reduce soil moisture, water and snow levels below the minimum necessary for sustaining plant, animal, and economic systems.</p> <p>Drought can have a widespread impact on the environment and the economy, depending upon its severity, although it typically does not result in loss of life or damage to property, as do other natural disasters.</p> <p>In Region 3, drought conditions can reduce water available for crops and domestic and industrial use, as well as affect the availability and cost of power for local industries.</p>	<p>Drought is the result of many causes, often synergistic in nature; these include global weather patterns that produce persistent, upper-level high-pressure systems along the West Coast with warm, dry air resulting in less precipitation.</p>	<p>During 1895-1995, much of the state was in severe or extreme drought at least 5 percent of the time. Region 3 was in severe or extreme drought from 5 to 10 percent of the time during this period.</p> <p>1977 Drought – This region experienced severe or extreme drought conditions between 10 to 20 percent of the time during this event.</p> <p>2001 Drought – At the height of the event in March 2001, much of this region experienced severe or extreme drought conditions.</p>	<p>In temperate regions of the world, including Washington state, current long-range forecasts of drought have limited reliability. Meteorologists do not believe that reliable forecasts are attainable any more than a season in advance.</p> <p>Drought conditions of at least moderate severity occur every few years in Washington.</p> <p>On a long-term basis, Region 3 experiences drought conditions of at least moderate severity from 5 to 10 percent of the time.</p>

### Region 3

Hazard: Drought		At Risk Population: Unknown of 413,538		PRELIMINARY ASSESSMENT	
State Agency Structures At Risk Number and Function of Buildings		No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings	
<u>Total at-risk buildings:</u> No state buildings.		0	0	0	
<u>Total at-risk critical facilities:</u> No state buildings.		0	0	0	

## Region 3

### Hazard: Earthquake

Characteristics	Principal Sources	Event History	Probability
<p>In general, Seismic Hazard Areas in Region 3 are found in:</p> <p>Areas near the Olympia fault in Thurston County, and the Canyon River, Saddle Mountain West and Saddle Mountain East faults in Mason County.</p> <p>Floodplains and the adjacent bluffs in the Chehalis, Cowlitz, Deschutes, Naselle, Newaukum, Nisqually, Quinault, Skokomish, and Willapa River valleys because of their high or medium susceptibility to liquefaction and other ground failures.</p> <p>Bluffs along shorelines, including those along the Pacific Coast and Puget Sound, because of their susceptibility to landslides and other ground failures.</p> <p>Shorelines of the Pacific Coast, Puget Sound and large lakes because of their susceptibility to tsunamis and seiches.</p>	<ol style="list-style-type: none"> <li>1. Interplate earthquake in the offshore Cascadia Subduction Zone. Evidence of quakes with magnitude greater than 8 have been found along the Washington coast; the most recent event was about 1700.</li> <li>2. Shallow, crustal earthquake in the North America (continental) plate. Such faults in this region include the Olympia, Canyon River, Saddle Mountain West and Saddle Mountain East faults.</li> <li>3. Deep, Benioff zone earthquake within the Juan de Fuca plate. This is the source for the 1949, 1965, and 2001 earthquakes, as well as the 1999 magnitude 5.8 Satsop earthquake that hit Grays Harbor County.</li> </ol>	<p>Since 1970, earthquakes of magnitude 4.0 or greater whose epicenter was in Region 3 occurred in 1976 (magnitude 4.0), 1983 (M4.3), 1989 (M4.9), 1999 (M5.8), 2001 (M6.8, M5.0, M4.3).</p> <p>The region received Presidential Disaster Declarations for the M6.5 Seattle-Tacoma earthquake in 1965 and the M6.8 Nisqually earthquake in 2001. The region experienced significant damage in the M7.1 Olympia earthquake in 1949, and minor damage in the M5.8 Satsop earthquake in 1999 (no disaster declaration).</p>	<p>Approximate recurrence rate for a magnitude 9 earthquake in the Cascadia Subduction Zone is once every 350 to 500 years.</p> <p>Approximate recurrence rate for earthquakes similar to the 1965 magnitude 6.5 Seattle-Tacoma and 2001 magnitude 6.8 Nisqually events is once every 35 years.</p> <p>Approximate recurrence rate for earthquakes similar to the 1949 magnitude 7.1 Olympia event is once every 110 years.</p> <p>Geologists continue to investigate the surface faults in this region and do not yet have sufficient information to determine previous seismicity nor estimated recurrence rates. However, they say a M6.5 or greater earthquake on a shallow, Puget Lowland fault occurs about once every 333 years.</p>



## Region 3

**Hazard:** Earthquake

**At Risk Population:** est. 170,462 of 413,538

### PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agency identified – 353 buildings (165 owned, 198 leased)	29,880	\$623,088,656	\$554,709,763

Function of at-risk buildings: Included are:

- Buildings of the State Capitol Campus, and nearby headquarters offices of nearly all agencies of state government.
- Campus of South Puget Sound Community College.
- Campuses of Green Hill School, Maple Lane School, and Naselle Youth Camp for juvenile offenders.
- Regional headquarters, local detachments, highway weigh scales, and communication facilities of the Washington State Patrol.
- About 160 general office and client service offices that include those serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Four state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to earthquake:

1. Interstate 5
2. U.S. Highway 8
3. U.S. Highway 12
4. U.S. Highway 101

<u>Total at-risk critical facilities:</u> State Agency identified – 119 buildings (owned-leased split not available)	8,809	\$172,249,400	\$98,851,503
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Function of at-risk critical facilities: Included are:

- Buildings of the State Capitol Campus, and nearby headquarters offices of nearly all agencies of state government.
- Buildings on the campus of South Puget Sound Community College.
- Buildings on the campuses of Green Hill School, Maple Lane School, and Naselle Youth Camp for juvenile offenders.
- Regional headquarters, local detachments, highway weigh scales, and communication facilities of the Washington State Patrol.
- About a dozen general office and client service offices that include those serving individuals and families on public assistance, providing

### **Region 3**

employment and training services, driver licensing, and liquor sales.

Four state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to earthquake:

1. Interstate 5
  2. U.S. Highway 8
  3. U.S. Highway 12
  4. U.S. Highway 101
-

## Region 3

### Hazard: Flood

Characteristics	Principal Flood Sources	Event History	Probability
<p>Region 3 is subject to two types of flooding – flooding that occurs on the county's major river systems (see right) and flooding that is the result of urbanization, particularly in small stream basins.</p> <p>Because of their origins in upper elevations, these rivers are influenced by snow and rain patterns in the Olympic and Cascade Mountains; flooding is most likely to occur from November through February during periods of heavy rainfall and rapid snowmelt. All nine rivers travel through broad floodplains with long histories of flooding. Bank erosion is also a threat on the rivers.</p>	<ol style="list-style-type: none"> <li>1. Chehalis River</li> <li>2. Cowlitz River</li> <li>3. Deschutes River</li> <li>4. Naselle River</li> <li>5. Newaukum River</li> <li>6. Nisqually River</li> <li>7. Quinault River</li> <li>8. Skokomish River</li> <li>9. Willapa River</li> </ol>	<p>Flooding in Region 3 is a common event. Since 1956, flooding resulted in Presidential Disaster Declarations in 1964, 1972 (2 disasters), 1974, 1975, 1974, 1977, 1979, 1986 (2 disasters), 1990 (3 disasters), 1995, 1996 (2 disasters), 1997 and 2003.</p> <p>Since 1989, more than \$19.7 million in Stafford Act disaster assistance has been provided to Region 3 for repairs to public facilities following flood events. More than 60 percent of the assistance went to Lewis County, about 19 percent to Thurston County, and about 14 percent to Grays Harbor County. (Note: Figures do not include October 2003 flood disaster; assistance programs are still being administered.)</p>	<p>The region's rivers typically flood every two to five years.</p> <p>Since 1956, this region has experienced serious flooding resulting in major damage and a Presidential Disaster Declaration about every three years.</p> <p>The five counties of Region 3 are among the top 12 with the largest percentage of area in the 100-year floodplain – Grays Harbor and Thurston Counties, 7.5 percent in 100-year floodplain; Mason County, 4.8 percent; Lewis County, 4.5 percent; and Pacific County, 3.1 percent.</p>

### Region 3

**Hazard:** Flood

**At Risk Population:** Unknown of 413,538

**PRELIMINARY ASSESSMENT**

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agency identified – 147 (97 owned, 50 leased)	8,912	\$222,330,122	\$157,454,575

Function of at-risk buildings: Included are:

- Campuses of Green Hill School, Maple Lane School, and Naselle Youth Camp for juvenile offenders.
- About 60 general office and client service offices that include those serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Four state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to flood where they cross or run through floodplains:

1. Interstate 5
2. U.S. Highway 8
3. U.S. Highway 12
4. U.S. Highway 101

<u>Total at-risk critical facilities:</u> State Agency identified – 60 (owned-leased split not available)	4,124	\$81,330,740	\$85,904,292
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Function of at-risk critical facilities: Included are:

- Buildings from the campuses of Green Hill School, Maple Lane School, and Naselle Youth Camp for juvenile offenders.
- About five general office and client service offices.

Four state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to flood where they cross or run through floodplains:

1. Interstate 5
2. U.S. Highway 8
3. U.S. Highway 12
4. U.S. Highway 101

## Region 3

### Hazard: Landslide

Characteristics	Principal Sources	Event History	Probability
<p>Region 3 is part of two landslide provinces.</p> <p>Olympic Mountains province (north end of region) – The Olympics have slope stability conditions and a variety of landslide types that occur throughout the state. In lower valleys without glaciers, earth flows are extensive. Recently glaciated valleys that penetrate core rocks have small rock falls.</p> <p>Southwest Washington province (south end of region) – Earth flow or slump is the dominant form of landslide in the province. Both ancient and active earth flows are common, in both high, steep terrain, but also in the low, rolling hills of the Chehalis-Centralia area. Debris flows are locally a problem in the western Cascades. They tend to occur where the rocks are strong and unweathered, on steep slopes and smooth surfaces overlain by thin soils. Intense rainstorms, or rain on wet snow, trigger these landslides.</p>	<ol style="list-style-type: none"> <li>1. Bluffs along shorelines of the Pacific Coast and large lakes</li> <li>2. Olympic Mountains.</li> </ol>	<p>February 1996 Storms and Landslides Disaster – The most significant landslide blocked Interstate 5 near Woodland; it took crews 11 days to fully reopen the highway. In Lewis County, a debris flow closed SR 7 near Mineral Lake for two days. The largest landslide destroyed a house five miles east of Glenoma. Two earth slides blocked Kresky Avenue in north Chehalis. In Thurston County, slumps and debris flows covered a road and railroad tracks on slopes below the Capitol Campus in Olympia and severed two sewer lines, spilling sewage into Capitol Lake.</p> <p>February 2001 Nisqually Earthquake Disaster – In Thurston County, lateral spreading occurred around Capitol Lake, damaging Deschutes Parkway and a dike at the south end of the lake, and breaking sewer and water lines. Sewer and water lines were severely damaged at Tolmie State Park. A debris flow/slump undermined US 101 west of Olympia. Lateral spreading damaged a perimeter road and mobile homes at Sunset Lake.</p>	<p>Ground failures that result in landslides have a number of contributing factors that do not allow for the development of a reasonable estimate probability of future events.</p> <p>Factors that contribute to ground failure and landslides include:</p> <ul style="list-style-type: none"> <li>• Local topography.</li> <li>• Erosion on slopes.</li> <li>• Saturation of slopes.</li> <li>• Earthquakes.</li> <li>• Volcanic deposits and debris flows.</li> <li>• Excess weight on weak slopes.</li> <li>• Human action that disturbs slopes.</li> </ul>

## Region 3

**Hazard:** Landslide

**At Risk Population:** Unknown of 413,538

### PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents All Buildings
<u>Total at-risk buildings:</u> State Agency identified – 97 (47 owned, 50 leased)	7,759	\$55,413,122	\$74,722,408

Function of at-risk buildings: Included are:

- Buildings on the State Capitol Campus.
- Campus of the Naselle Youth Camp for juvenile offenders.
- About 50 general office and client service offices that include those serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Four state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to landslide as they cross steep slopes:

1. Interstate 5
2. U.S. Highway 8
3. U.S. Highway 12
4. U.S. Highway 101

<u>Total at-risk critical facilities:</u> State Agency identified – 36 (owned-leased split not available)	3,476	\$10,000,000	\$33,193,667
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Function of at-risk critical facilities: Included are:

- Buildings on the State Capitol Campus.
- Campus of the Naselle Youth Camp for juvenile offenders.

Four state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to landslide as they cross steep slopes:

1. Interstate 5
2. U.S. Highway 8
3. U.S. Highway 12
4. U.S. Highway 101

## Region 3

### Hazard: Severe Storm

Characteristics	Principal Sources	Event History	Probability
<p>A severe storm is an atmospheric disturbance that results in one or more of the following phenomena: strong winds and large hail, thunderstorms, tornados, rain, snow, or other mixed precipitation. Most storms move into Washington from the Pacific Ocean.</p> <p>Typically, major impacts from a severe storm are to transportation and loss of utilities.</p>	<ol style="list-style-type: none"> <li>1. High winds</li> <li>2. Winter storm</li> <li>3. Coastal flooding</li> </ol>	<p>Severe storm in Region 3 is a common event. Since 1956, severe storm events resulted in Presidential Disaster Declarations in 1962, 1972, 1974, 1975, 1977, 1979, 1986, 1990 (two disasters), 1993, 1995, and 1996 (two disasters).</p> <p>Since 1989, Region 3 received more than \$11.6 million in Stafford Act disaster assistance for repairs to public facilities following severe storm events. More than 40 percent of assistance was provided to mason County, 22 percent to Lewis County, and about 18 percent each to Grays Harbor and Thurston Counties.</p>	<p>Projected recurrence rates for the severe storm events to which Region 3 is most vulnerable are as follows:</p> <p>High wind events occur once or twice a year throughout the region.</p> <p>Winter storms occur about once every two years in Mason and Thurston Counties.</p> <p>Coastal flooding occurs about once every four years in coastal areas of Grays Harbor and Pacific Counties, and about once every 12 years in Thurston County.</p>

## Region 3

**Hazard:** Severe Storm

**At Risk Population:** 413,538 of 413,538

### PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents
<u>Total at-risk buildings:</u> State Agency identified – 310 (145 owned, 165 leased)	26,209	\$529,611,390	\$503,856,959
<u>Function of at-risk buildings:</u> Included are:			
<ul style="list-style-type: none"> <li>• Buildings of the State Capitol Campus, and nearby headquarters offices of nearly all agencies of state government.</li> <li>• Campus of South Puget Sound Community College.</li> <li>• Campuses of Green Hill School, Maple Lane School, and Naselle Youth Camp for juvenile offenders.</li> <li>• Regional headquarters, local detachments, highway weigh scales, and communication facilities of the Washington State Patrol.</li> <li>• About 135 general office and client service offices that include those serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.</li> </ul>			
<u>Total at-risk critical facilities:</u> State Agency identified – 119 (owned-leased split not available)	8,809	\$172,294,400	\$98,851,503
<u>Function of at-risk critical facilities:</u> Included are:			
<ul style="list-style-type: none"> <li>• Buildings of the State Capitol Campus, and nearby headquarters offices of nearly all agencies of state government.</li> <li>• Buildings on the campus of South Puget Sound Community College.</li> <li>• Buildings on the campuses of Green Hill School, Maple Lane School, and Naselle Youth Camp for juvenile offenders.</li> <li>• Regional headquarters, local detachments, highway weigh scales, and communication facilities of the Washington State Patrol.</li> <li>• About a dozen general office and client service offices that include those serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.</li> </ul>			



## Region 3

### Hazard: Tsunami

Characteristics	Principal Sources	Event History	Probability
<p>A tsunami resembles a series of quickly rising tides that withdraw with currents much like those of a river. Swift currents commonly cause most of the damage. A Pacific Ocean tsunami can affect the entire Pacific basin, while a tsunami in inland waters can affect many miles of shoreline.</p> <p>Tsunamis typically cause the most severe damage and casualties near their source. Waves are highest there because they have not yet lost much energy.</p> <p>Another class of damaging water wave is a seiche. A seiche is a wave generated in a body of water from the passage of seismic waves caused by earthquakes. Sedimentary basins beneath the body of water can amplify a seismic seiche and the natural sloshing action in a body of water or focus water waves onto a section of shoreline.</p>	<p>Tsunamis and seiches can be generated by a number of sources:</p> <ol style="list-style-type: none"> <li>1. Distant earthquakes along the Pacific Rim (i.e., 1964 Alaska earthquake).</li> <li>2. Local earthquakes, such as those generated by local surface faults; in the Benioff zone; or in the Cascadia Subduction Zone off the coast.</li> <li>3. Large landslides into bodies of water, such as Vancouver Lake or the Columbia River.</li> <li>4. Submarine landslides in bodies of water such as Puget Sound.</li> </ol>	<p>1700 – The magnitude 9.0 Cascadia Subduction Zone earthquake is believed to have deposited sand on marshes and in lakes along the southern coast.</p> <p>1946 – Recorded wave height for the tsunami generated by the M7.8 earthquake in the Aleutian Islands off Alaska was 1.5 feet in Taholah.</p> <p>1960 – The M9.5 Chilean earthquake generated a tsunami with an observed wave height of two feet in Tokeland.</p> <p>1964 – Recorded wave heights for the tsunami generated by the M9.2 Alaska earthquake were from 1.4 feet at Ilwaco up to 4.5 feet in Wreck Creek.</p>	<p>Great earthquakes in the North Pacific or along the Pacific coast of South America that generate tsunamis that sweep through the entire Pacific basin occur at a rate of about six every 100 years.</p> <p>Geologists have not conducted research on surface faults in Region 3 to determine their seismicity and recurrence intervals; they also have not determined nor whether they would be capable of generating a tsunami or seiche.</p>

## Region 3

**Hazard:** Tsunami

**At Risk Population:** 23,054 of 413,538

### PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents
<u>Total at-risk buildings:</u> State Agency identified – 19 (three owned, 16 leased)	1,890	\$11,045,024	\$18,036,064

Function of at-risk buildings: Included in the state facilities potentially at risk to the direct and indirect impacts of tsunami are the following:

- Buildings at the Naselle Youth Camp for juvenile offenders.
- General office and client service offices that include those serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Two state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to tsunami as they skirt vulnerable shorelines:

1. U.S. Highway 12
2. U.S. Highway 101

<u>Total at-risk critical facilities:</u> State Agency identified – 9 (owned-leased split not available)	1,286	0	\$11,394,000
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Function of at-risk critical facilities: Included in the state facilities potentially at risk to the direct and indirect impacts of tsunami are the following:

- Campus of the Naselle Youth Camp for juvenile offenders.
- General office and client service offices.

Two state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to tsunami as they skirt vulnerable shorelines:

1. U.S. Highway 12
2. U.S. Highway 101

## Region 3

### Hazard: Volcano

Characteristics	Volcanoes in Region	Event History	Probability
<p>Region 3 does not have a resident volcano.</p> <p>However, it could be affected by a lahar from Mount Rainier or ash fall from volcanoes in Washington state or the Canadian province of British Columbia.</p>	<p>None. The closest volcanoes are Mount Rainier in Region 5, Mount St. Helens in Region 4, and Mount Adams in Region 7.</p>	<p>Mount Rainier in Pierce County has produced at least four eruptions and numerous lahars in the past 4,000 years, including the National Lahar (a Case II lahar), which inundated the Nisqually River Valley to Puget Sound.</p> <p>Mount St. Helens in Skamania County is the most active volcano in the Cascades. During the past 4,000 years, it has produced many lahars and a wide variety of eruptive activity, from relatively quiet outflows of lava to explosive eruptions much larger than that of May 18, 1980.</p> <p>Mount Adams in Yakima County has produced few eruptions during the past several thousand years. This volcano's most recent activity was a series of small eruptions about 1,000 years ago.</p>	<p>Lahars that reach the Puget Lowland occur every 500 to 1,000 years, with smaller flows not traveling as far occurring more frequently. Recurrence rate for lahars flowing off Mount Rainier are as follows:</p> <p>Case M – These lahars occur far less than once every 1,000 years.</p> <p>Case I – These lahars occur about once every 500 to 1,000 years.</p> <p>Case II – These lahars occur about once every 100 years.</p> <p>Case III – These lahars can occur as frequently as once a year or as far apart as once every 100 years.</p> <p>Due to prevailing westerly winds, the possibility of an annual ash fall of one centimeter in Region 3 is as follows:</p> <p>Mount Rainier – Less than 1 in 10,000.</p> <p>Mount St. Helens – Less than 1 in 10,000.</p> <p>Mount Adams - Less than 1 in 10,000.</p> <p>Any major Cascade volcano – ranges from 1 in 5,000 to 1 in 10,000.</p>

## Region 3

**Hazard:** Volcano

**At Risk Population:** est. 26,519 of 413,538

### PRELIMINARY ASSESSMENT

State Agency Structures At Risk Number and Function of Buildings	No. of Affected Staff / Visitors / Residents	Approx. Value of Owned Structures	Approx. Value of Contents
<u>Total at-risk buildings:</u> State Agency identified – 117 (28 owned, 89 leased)	10,784	\$243,915,410	\$142,182,759

Function of at-risk buildings: Included in the state facilities potentially at risk to lahar or ash fall from a volcanic eruption are the following:

- Buildings of the State Capitol Campus, and nearby headquarters offices of nearly all agencies of state government.
- Campuses of Green Hill School and Maple Lane School for juvenile offenders.
- About 35 general office and client service offices that include those serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

Two state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to volcanic eruptions that produce lahars in river valleys crossed by the highways:

1. Interstate 5, in the Nisqually River delta area of Thurston County.
2. US Highway 12, along the Cowlitz River in Lewis County.

<u>Total at-risk critical facilities:</u> State Agency identified – 29 (owned-leased split not available)	1,646	\$71,401,104	\$59,532,942
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Function of at-risk critical facilities: Included in the state facilities potentially at risk to lahar or ash fall from a volcanic eruption are buildings on the campuses of Green Hill School and Maple Lane School for juvenile offenders, and general office and client services offices.

Two state highways considered emphasis corridors because of their importance to movement of people and freight are potentially at risk to volcanic eruptions that produce lahars in river valleys crossed by the highways:

1. Interstate 5, in the Nisqually River delta area of Thurston County.
2. US Highway 12, along the Cowlitz River in Lewis County.

## Region 3

### Hazard: Wildland Fire

Characteristics	Principal Sources	Event History	Probability
<p>Wildland fires are fires caused by nature or humans that result in the uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.</p> <p>A fire needs three elements in the right combination to start and grow – a heat source, fuel, and oxygen. How a fire behaves primarily depends on the characteristics of available fuel, weather conditions, and terrain.</p> <p>The wildland fire season in Washington usually begins in early July and typically culminates in late September with a moisture event. Drought, snow pack, and local weather conditions can expand the length of the fire season.</p>	<ol style="list-style-type: none"> <li>1. Humans – people start most wildland fires; from 1992 to 2001, people, on average, caused more than 500 wildland fires each year on state-protected lands. Human-caused fires burn an average of 4,404 state-protected acres each year.</li> <li>2. Lightning – lightning on average started 135 wildland fires annually on state-protected lands during 1992-2001. Lightning-caused fires burn more state-protected acreage than any other cause, an average of 10,866 acres annually.</li> </ol>	<p>None of the state's most significant wildland fires occurred in this region, although smaller wildland fires occurred annually.</p> <p>Region 3 is part of two fire protection regions of the Washington Department of Natural Resources, the Olympic and Central regions. During 1992-2001, these regions have averaged 172 fires a year that burned an average of 272 acres of state-protected lands (specific fire data for Region 3 is not available.)</p>	<p>Nearly all of the state's significant wildland fires have occurred in Eastern Washington.</p> <p>Western Washington is less prone to catastrophic wildland fires than Eastern Washington – the east has both lighter fuels that burn more easily and more snags and hazard trees, and weather conditions more favorable to fire (thunderstorms with dry lightning are more prevalent in the east).</p> <p>Also, the west has a shorter fire season than the eastern half of the state – the west receives more rainfall, has wetter and cooler spring seasons, and is more urbanized.</p>

### Region 3

**Hazard:** Wildland Fire

**At Risk Population:** est. 58,408 of 413,538

**PRELIMINARY ASSESSMENT**

<b>State Agency Structures At Risk Number and Function of Buildings</b>	<b>No. of Affected Staff / Visitors / Residents</b>	<b>Approx. Value of Owned Structures</b>	<b>Approx. Value of Contents</b>
<u>Total at-risk buildings:</u> State Agency identified – 105 (__owned, __leased)	8,933	\$150,326,722	\$195,559,414

Function of at-risk buildings: Included are:

- Campus of South Puget Sound Community College.
- Campus of Naselle Youth Camp for juvenile offenders.
- About 45 general office and client service offices that include those serving individuals and families on public assistance, providing employment and training services, driver licensing, and liquor sales.

<u>Total at-risk critical facilities:</u> State Agency identified – 30 (owned-leased split not available)	2,345	\$17,341,704	\$32,907,054
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Function of at-risk critical facilities: Included are:

- Buildings on the campus of South Puget Sound Community College.
- Buildings on the campus of Naselle Youth Camp for juvenile offenders.
- General office and client service offices.

## Region 3

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<sup>1</sup> *Grays Harbor and Pacific County Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, April 2002.

<sup>2</sup> *Lewis County Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, March 2001.

<sup>3</sup> *Mason County Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, March 2002.

<sup>4</sup> *Grays Harbor and Pacific County Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, April 2002.

<sup>5</sup> *Thurston County Profile*, Washington Department of Employment Security, Labor Market and Economic Analysis Branch, December 1999.

<sup>6</sup> *Profile of Selected Economic Characteristics: Census 2000*, U.S. Census Bureau.

<sup>7</sup> *Summary of Public Transportation 2001*, Washington State Department of Transportation, November 2002 (Revised April 2003).